

What is claimed is:

1. A washing machine comprising:

a steam generator for generating steam;

5 a circulation pump for pumping circulation water discharged from a tub and re-supplying it into a drum;

a spray nozzle for spraying steam generated from the steam generator and the circulation water pumped from the circulation pump into the drum; and

10 a back-current preventing branch unit connected to the steam generator by a steam supply line, connected to the circulation pump by a circulation line, and connected to the spray nozzle, so as to prevent circulation water supplied to the spray nozzle from flowing back to the steam supply line or steam supplied to the spray nozzle from flowing back to the circulation line.

15 2. The washing machine of claim 1, wherein the back-current preventing branch unit comprises:

a steam supply unit connected to the steam supply line and receiving steam;

20 a circulation water supply unit connected to the circulation line and receiving circulation water;

a nozzle connection unit communicating with the steam supply unit and the circulation water supply unit so as to be connected to the spray nozzle; and

25 a back-current for preventing the steam supply unit or the circulation water supply unit to prevent plate for preventing steam or circulation water from flowing backward.

3. The washing machine of claim 2, wherein the back-current preventing plate is rotatably mounted by a hinge pin at a position where the steam supply unit and the circulation water supply unit, and operated by a pressure of steam and circulation water.

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4. The washing machine of claim 2, wherein a tightly-attaching protrusion is formed at an inner circumferential surface of the steam supply unit and at an inner circumferential surface of the circulation water supply unit, to which the back-current preventing plate is attached to maintain air-tightness.

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5. The washing machine of claim 2, wherein the spray nozzle comprises:

a flange unit engaged with the nozzle connection unit;

a nozzle unit formed at a lower side of the flange unit and spraying

15 circulation water or steam into the drum; and

a guide unit formed at one side of the nozzle unit and guiding circulation water or steam to be evenly sprayed into the drum from the nozzle unit.

6. The washing machine of claim 5, wherein the horizontal spray angle ( $\theta_1$ ) of the spray nozzle is greater than  $90^\circ$  but smaller than  $100^\circ$  ( $90^\circ < \theta_1 < 100^\circ$ ).

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7. The washing machine of claim 5, wherein the vertical spray angle ( $\theta_2$ ) of the spray nozzle is greater than  $35^\circ$  but smaller than  $40^\circ$  ( $35^\circ < \theta_2 < 40^\circ$ ).

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8. The washing machine of claim 1, wherein the back-current preventing branch unit comprises:

a steam supply unit connected to the steam supply line and receiving steam;

5 a circulation water supply unit connected to the circulation line and receiving circulation water;

a nozzle connection unit communicating with the steam supply unit and the circulation water supply unit so as to be connected to the spray nozzle; and

a partition wall formed in a longitudinal direction at the center of the nozzle connection unit and partitioning a steam supply passage and a circulation water supply passage to prevent steam or circulation water from flowing backward.

9. The washing machine of claim 1, wherein the back-current preventing branch unit comprises:

15 a first supply unit connected to one of the steam supply line and the circulation line and supplying steam or circulation water directly to the spray nozzle; and

a second supply unit branched at a predetermined angle from one side of the first supply unit and supplying the other remaining one to the spray nozzle.

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10. The washing machine of claim 9, wherein the second supply unit and the first supply unit make an angle ( $\theta_3$ ) of smaller than  $30^\circ$  therebetween.

11. A washing machine comprising:

25 a steam generator for generating steam;

a circulation pump for pumping circulation water discharged from a tub and re-supplying the circulation water into a drum; and

a spray device connected to the steam generator by a steam supply unit and to a circulation pump by a circulation line so as to spray steam or circulation  
5 water into the drum,

wherein the spray device comprises:

a main body connected to the steam supply line and the circulation line;

a spray unit formed at an end portion of the main body and  
10 spraying steam or circulation water into the drum;

a steam passage formed inside the main body and supplying steam introduced through the steam supply line to the spray unit; and

a circulation water passage formed inside the main body and supplying circulation water introduced through the circulation line to the  
15 spray unit.

12. The washing machine of claim 11, wherein the main body comprises:

a steam supply unit connected to the steam supply line and provided with  
20 steam;

a circulation water supply unit connected to the circulation line so as to receive circulation water; and

a connection unit communicating with the steam supply unit and the circulation water supply unit, and having the spray unit mounted at its end portion.

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13. The washing machine of claim 12, wherein the steam passage is formed by a steam pipe mounted at an inner circumferential surface of the steam supply unit of the main body and connected to the spray unit after passing the connection unit, and the circulation water passage is formed by a circulation water pipe mounted at an inner circumferential surface of the circulation water supply unit of the main body and connected to the spray unit after passing an inner circumferential surface of the steam pipe.

14. The washing machine of claim 12, wherein an inner diameter of the steam pipe is greater than an outer diameter of the circulation water pipe disposed at the connection unit.

15. The washing machine of claim 12, wherein the spray unit comprises:

a plate fixed at an end portion of the connection unit of the main body, to which end portions of the steam pipe and the circulation water pipe are fixed;

circulation water spray holes formed at the center of the plate and spraying circulation water supplied through the circulation water passage; and

steam spray holes formed in an outer circumferential direction of the plate and spraying steam supplied in the steam passage.

16. The washing machine of claim 15, wherein a guide panel is formed at an end portion of the connection unit in order to guide circulation water or steam sprayed from the circulation water spray holes and the steam spray holes to be introduced into the drum.

17. The washing machine of claim 12, wherein the steam passage is formed by a steam pipe mounted at the inner circumferential surface of the steam supply unit of the main body and connected to the spray unit after passing the connection unit, and the circulation water passage is formed by a circulation water pipe mounted at the inner circumferential surface of the circulation water supply unit of the main body and connected to the spray unit after passing the connection unit, like the steam passage.

18. The washing machine of claim 17, wherein the spray unit comprises:

a steam spray hole formed at one side of the connection unit and spraying steam supplied to the steam passage; and

a circulation water spray hole formed at the other side of the connection unit and spraying circulation water supplied to the circulation water passage.